

**WHAT IS CLAIMED IS:**

1. A solenoid assembly for a starter motor assembly including a plurality of individual coils connected in parallel to form a pull-in coil.
2. The solenoid assembly of claim 1 wherein the plurality of coils comprises three coils.
3. The solenoid assembly of claim 1 wherein the plurality of coils are formed from a single wire cut and connected to form the pull-in coil.
4. The solenoid assembly of claim 3 wherein, after the single wire is cut, each of the coils has a first lead and a second lead, and wherein the first leads of each coil are connected together and the second leads of each coil are connected together.
5. The solenoid assembly of claim 3 wherein the single wire is about 1.0 millimeters to about 1.5 millimeters in diameter.
6. A solenoid assembly for a starter motor assembly including a pull-in coil comprised of three individual coils connected in parallel.
7. The solenoid assembly of claim 6 wherein the three individuals coils are formed from a single wire cut at two points and then connected to form the pull-in coil.
8. The solenoid assembly of claim 7 wherein, after the wire is cut at two points, each of the three coils has a first lead and a second lead, and wherein the three individual coils are connected to form the pull-in coil by connecting the first leads of each coil together and connecting the second leads of each coil together.

U.S. PATENT AND TRADEMARK OFFICE

**LAW OFFICES**

FINNEGAN, HENDERSON,  
FARABOW, GARRETT,  
& DUNNER, L.L.P.  
1300 I STREET, N. W.  
WASHINGTON, DC 20005  
202-408-4000

9. The solenoid assembly of claim 7 wherein the single wire is about 1.0 millimeters to about 1.5 millimeters in diameter.

10. A pull-in coil for a solenoid assembly for a starter motor assembly comprising multiple coils connected in parallel.

11. The pull-in coil of claim 10 wherein the pull-in coil is comprised of three coils.

12. The pull-in coil of claim 11 wherein the three coils are formed from a single wire that is cut at two points to form the three coils.

13. The pull-in coil of claim 12 wherein, after the wire is cut at two points, each of the three coils has a first lead and a second lead, and wherein the first leads of each coil are connected together and the second leads of each coil are connected together.

14. A method of making a pull-in coil for a solenoid assembly for a starter motor assembly comprised of the steps of:

winding a wire down a length of a solenoid coil holder and then back up the length of the solenoid coil holder a plurality of times;

cutting the wire at points to form separate coils, each coil then having a first lead and a second lead opposite the first lead; and

electrically connecting the first leads of the coils together and electrically connecting the second leads of the coils together to form the pull-in coil.

15. The method of claim 14 wherein the wire is wound down and back up the length of the solenoid coil holder three times and the wire is cut at two points.

U.S. PATENT & TRADEMARK OFFICE  
COMMUNICATIONS SECTION  
WASHINGTON, D.C. 20540  
TELEPHONE (202) 346-3000  
FAX (202) 346-3001  
WWW.USPTO.GOV

LAW OFFICES

FINNEGAN, HENDERSON,  
FARABOW, GARRETT,  
& DUNNER, L.L.P.  
1300 I STREET, N.W.  
WASHINGTON, DC 20005  
202-408-4000

16. The method of claim 14 wherein the wire is about 1.0 millimeters to about 1.5 millimeters in diameter.

17. The method of claim 14 wherein electrically connecting the first leads and the second leads comprises tying the first leads together and tying the second leads together.

18. The method of claim 14 wherein electrically connecting the first leads and the second leads comprises twisting the first leads together and twisting the second leads together.

19. The method of claim 14 wherein electrically connecting the first leads and the second leads comprises soldering the first leads together and soldering the second leads together.

20. The method of claim 14 wherein electrically connecting the first leads and the second leads comprises crimping the first leads together and crimping the second leads together.

21. A method of making a pull-in coil for a solenoid assembly for a starter motor assembly comprised of the steps of:

winding a wire down a length of a solenoid coil holder and then back up the length of the solenoid coil holder three times;

cutting the wire at two points to form separate coils, each coil then having a first lead and a second lead opposite the first lead; and

2025 RELEASE UNDER E.O. 14176

electrically connecting the first leads of the coils together and electrically connecting the second leads of the coils together to form the pull-in coil.

22. The method of claim 21 wherein the wire is about 1.0 millimeters to about 1.5 millimeters in diameter.

23. The method of claim 21 wherein electrically connecting the first leads and the second leads comprises tying the first leads together and tying the second leads together.

24. The method of claim 21 wherein electrically connecting the first leads and the second leads comprises twisting the first leads together and twisting the second leads together.

25. The method of claim 21 wherein electrically connecting the first leads and the second leads comprises soldering the first leads together and soldering the second leads together.

26. The method of claim 21 wherein electrically connecting the first leads and the second leads comprises crimping the first leads together and crimping the second leads together.

27. A method of making a pull-in coil comprised of multiple coils connected in parallel for a solenoid assembly for a starter motor assembly comprised of the steps of:

LAW OFFICES

FINNEGAN, HENDERSON,  
FARABOW, GARRETT,  
& DUNNER, L.L.P.  
1300 I STREET, N. W.  
WASHINGTON, DC 20005  
202-408-4000



winding the wire down and back up the length of the solenoid coil holder a second time,

looping the wire outside the solenoid coil holder a second time to form a second loop outside the solenoid coil holder,

winding the wire down and back up the length of the solenoid coil holder a third time,

cutting the wire at two points, one point being along the first loop and the second point being along the second loop, to form separate coils, each coil then having a first lead and a second lead opposite the first lead; and

electrically connecting the first leads of the coils together and electrically connecting the second leads of the coils together to form the pull-in coil.

29. The method of claim 28 wherein the wire is about 1.0 millimeters to about 1.5 millimeters in diameter.

30. The method of claim 28 wherein electrically connecting the first leads and the second leads comprises tying the first leads together and tying the second leads together.

31. The method of claim 28 wherein electrically connecting the first leads and the second leads comprises twisting the first leads together and twisting the second leads together.

32. The method of claim 28 wherein electrically connecting the first leads and the second leads comprises soldering the first leads together and soldering the second

2025 RELEASE UNDER E.O. 14176

leads together.

33. The method of claim 28 wherein electrically connecting the first leads and the second leads comprises crimping the first leads together and crimping the second leads together.

THE PATENT OFFICE OF THE UNITED STATES OF AMERICA

LAW OFFICES

FINNEGAN, HENDERSON,  
FARABOW, GARRETT,  
& DUNNER, L.L.P.  
1300 I STREET, N.W.  
WASHINGTON, DC 20005  
202-408-4000